What is it like to be Confabulating?

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Different kinds of confabulations may arise in neurological and psychiatric disorders. This chapter first offers conceptual distinctions between spontaneous and momentary ("provoked") confabulations, as well as between these types of confabulation and other kinds of false memories. The chapter then reviews current explanatory theories, emphasizing that both neurocognitive and motivational factors account for the content of confabulations. We place particular emphasis on a general model of confabulation that considers cognitive dysfunctions in memory and executive functioning in parallel with social and emotional factors. It is argued that all these dimensions need to be taken into account for a phenomenologically rich description of confabulation. The role of the motivated content of confabulation and the subjective experience of the patient are particularly relevant in effective management and rehabilitation strategies. Finally, we discuss a case example in order to illustrate how seemingly meaningless false memories are actually meaningful if placed in the context of the patient's own perspective and autobiographical memory.

Key words: Confabulation; False memory; Motivation; Self; Rehabilitation.

Memory is often subject to errors of omission and commission such that recollection includes instances of forgetting, or distorting past experience. The study of pathological forms of exaggerated memory distortion has provided useful insights into the mechanisms of normal reconstructive remembering (Johnson, 1991; Kopelman, 1999; Schacter, Norman & Kotstall, 1998). An extreme form of pathological memory distortion is confabulation. Different variants of confabulation are found to arise in neurological and psychiatric disorders. It is beyond the scope of this chapter to accommodate the full range of these disorders. In this chapter we will instead focus on confabulation as a subtype of memory distortion.

We will provide a brief account of the different "sub-types" of confabulation and the various explanatory theories. Special emphasis will be given to the motivated and emotional content of confabulations. We will propose a general model integrating the multiple factors involved in confabulation, including social, personal and biological components. We will further argue that for a phenomenologically rich description of confabulation neurocognitive models must accommodate these factors. The chapter will lastly consider the role of the motivated content of confabulation and the subjective experience of the patient in the context of effective management and rehabilitation strategies.

What is Confabulation?

In the modern medical literature, Korsakoff (1889/1996) was one of the first to describe the false recollections of amnesic patients, pseudoreminiscences, now replaced by the term confabulation. Amnesic confabulation has been reported in a number of

neuropathologies, including Alzheimer's disease and traumatic brain injury (see Joohnson, Haynes, D'Esposito & Raye, 2000).

Confabulation broadly refers to false or erroneous memories arising in the context of neurological disease (Kopelman, 2010). For example, the patient believes their spouse is an imposter or that their parents frequently visit, when they have actually been deceased for very many years. There is much consensus surrounding the definition of confabulation as false memories produced without conscious knowledge of their falsehood (Dalla Barba, 1993; Johnson et al., 2000; Moscovitch, 1989). However, there is less agreement however regarding the potential subtypes and characteristics of confabulations (DeLuca, 2000).

Confabulations can take various forms. Although the exact taxonomy of confabulations remains unclear, this chapter will identify and discuss three broad "sub-types" of confabulation: spontaneous confabulation, momentary confabulation and other forms of false memories. Despite the difficulty in drawing a precise boundary (Berlyne, 1972; Schnider, 2003), "spontaneous confabulation" and "momentary confabulation" will nevertheless be kept conceptually distinct but for the purpose of this chapter, brief commentary on the other forms of false memories that are not overtly related to neurological damage, specifically, false confessions and pseudologia fantastica, will be added as needed.

Table 1. Defining confabulation and potential subtypes

Term	Definitions
Confabulation	False memories produced without conscious knowledge of their falsehood
Spontaneous confabulation	Persistent, unprovoked outpouring of erroneous memories
Momentary or "provoked" confabulations	Fleeting intrusion errors produced as a result to provoked questions probing the patient's memory
Other forms of false memories	Specific circumstances in which false memories arise in the absence of overt neurological damage, e.g. false confessions and pseudologia fantastica

Spontaneous Confabulation in Brain Disease

In spontaneous confabulation, there is a persistent, unprovoked outpouring of erroneous memories (Kopelman, 1999, 2010). These false memories are often held with firm conviction, sometimes bizarre and 'fantastic', and typically preoccupying. The example below provides a vivid description of a profound case of spontaneous confabulation.

Case example

AB was a 43-year-old hospital employee, who was admitted to the Accident and Emergency department with Wernicke's encephalopathy (confusion opthalmoplegia, ataxia, and nystagmus). She was found to have a half empty bottle of vodka in her handbag. Despite high doses of multivitamins, the patient continued to confabulate floridly, and subsequently cancer of the cervix was diagnosed. She exhibited confabulations in episodic memory by stating that she had been admitted for measles, and that her parents were visiting her regularly, despite the

fact that they had been dead for 4 and 20 years respectively. She talked about being employed in the hospital, but identified the wrong hospital. She said that her brother was a doctor living on the 22nd floor, when her ward was on the top floor (the 12th). She also confabulated in semantic memory, saying that Stanley Baldwin was still the Prime Minister, and that Robert Maxwell (the newspaper proprietor) had been shot. (Kopelman, Ng, & van den Brouke, 1997)

Spontaneous confabulation is usually attributed to executive dysfunction resulting from frontal lobe pathology (Baddeley & Wilson, 1986; Kapur & Coughlan, 1980; Luria, 1976). More specifically, it is frequently associated with lesions of the ventro-medial prefrontal cortex (Gilboa et al., 2006; Gilboa & Moscovitch, 2002; Toosy et al., 2008; Turner, Cipolotti, Yousry & Shallice, 2008), and surrounding areas, including orbitalfrontal cortex, the basal forebrain, the anterior cingulate cortex, and other "anterior limbic" areas (Johnson et al., 2000; Schnider, 2003). In more rare cases, spontaneous confabulation may occur in other, more generalized disorders, such as confusional states (DeLuca &Cicerone, 1991). Although frontal lobe pathology appears to be a prerequisite for spontaneous confabulation, many patients with severe executive impairments in fact do not confabulate. Spontaneous confabulations therefore do occur in patients with executive dysfunction, but this may not be the only causative factor (Kopelman et al., 1997; Dalla Barba et al., 1999).

A number of explanatory theories of spontaneous confabulation have been proposed. Kopelman (2010) suggests four main classes of theories: (1) context memory confusion or source monitoring deficit, (2) trace specification/verification or strategic retrieval deficits; and more recently, (3) motivational theories and (4) interactionist accounts. The above theories will be outlined below, with particular attention given to

interactionist accounts that incorporate neurocognitive as well as motivational-emotional theories.

Context confusions/source monitoring deficits

The first group of theories propose that contextual deficits, particularly temporal confusions, and/or source monitoring deficits, are the basis of confabulation. Korsakoff (1889/1955, p. 404) was the first to describe case reports of patients who confused "old recollections with present impressions":

> In telling of something about the past, the patient would suddenly confuse events and would introduce the events related to one period into the story about another period....Telling of a trip she had made to Finland before her illness and describing her voyage in fair detail, the patient mixed into the story her recollections of the Crimea, and so it turned out that in Finland people always eat lamb and the inhabitants are Tartars.

Temporal context confusion in confabulation has similarly been emphasized by other researchers in this field (Moll, 1915; Talland, 1965; van der Host, 1932; Victor, Adams, & Collins, 1971). More recently, Schnider (Schnider, Ptak, von Daniken, & Remonda, 2000; Schnider et al., 1996) set apart a small group of spontaneous confabulators from other amnesic patients and healthy controls, observing normal memory and executive function, but impaired performance on an implicit temporal context memory task. Schnider (2003, 2008) recently framed this dysfunction as a general failure in "reality monitoring". Similarly Dalla Barba (1993; Dalla Barba et al., 1997) elaborates on this hypothesis by suggesting that confabulators 'temporal consciousness' is intact, but malfunctioning. Examining a number of amnesic patients in Korsakoff's syndrome and Alzheimer's disease, the authors argued that these patients are unable to make temporal

judgments. As opposed to severely amnesic patients, confabulators are aware of the past, present and future, but only recall rudimentary and essential facts from their long-term memory (Dalla Barba & Boisse, 2009).

Trace specification and verification deficits

The second group of theories identifies faulty specification in memory retrieval as the basis for confabulation. Burgess and Shallice (1996) claim that confabulation arises from deficits in two processes: a descriptor process (an editor process), and a mediator process. In a retrieval task, the 'descriptor' specifies the type of trace needed, and the likelihood of an incorrect rerepresentation being produced increases with specification demands. The 'editor' monitors the output, checking that it fits with previously retrieved memories and the overall task demands. Confabulators respond with 'unchecked' responses due to an impairment in the 'editor' process. The 'mediator' process oversees cognitive functions, such as strategy and problem solving, which monitors the plausibility of the retrieved memory components. Therefore bizarre confabulations are produced as a result of a faulty 'mediator' process.

Similarly Moscovitch and Melo (1997) attribute confabulation as the outcome of impaired cue-retrieval, faulty strategic search and defective monitoring. Faulty monitoring is said to result in inappropriate memories not being edited out. Within the same framework Schacter, Norman and Koutstaal (1998) argue that confabulation may arise due to faulty retrieval description, or impairment in post-retrieval monitoring and verification.

Motivational Theories

The above models have undoubtedly enhanced our understanding of memory-related confabulation. However, traditional neurocognitive psychologists have mostly neglected the emotional component of memory-related confabulation (Fotopoulou, 2010). Working within a multi-factorial paradigm, it has been proposed in more recent studies that the content of the confabulation might be motivated. Conway and Tacchi's (1996) pioneering case-study laid the foundation for future empirical investigations on the role of emotion and motivation in confabulation. The case-study describes a 73-year-old women who had bilateral damage to the temporal and frontal lobes following closed head injury. She presented with memory disturbances in episodic and semantic memory, deficits in executive function and visual processing, severe impairments in autobiographical memory, and confabulations. Conway and Tacchi describe how her confabulated memories were indeed motivated confabulations. They explained that the patients' confabulations might be attributed to *a combination* of a failure of executive editing of memories and of motivational biases. Their case-example provides an insightful description in which confabulations functioned to transform "the present into a time of harmony and comfort rather than distress" (Conway & Tacchi, 1996, p.333).

These accounts can be tracked back to Jaspers' (1913/1974) distinction between the "content" of abnormal mental phenomena (such as motivational factors) and their "form" (underlying deficit or dysfunction) (See Haefner discussion of Jaspers' distinction, this volume). Rather than regarding the content of confabulations as incomprehensible or negligible, the patients' current preoccupations and motivations may be the underlying drive influencing the content of the confabulations. It is in this context

that the subjective experience of the patient, within the phenomenological approach, surfaces as an essential factor, which influences the neurocognitive models and explanatory theories of spontaneous confabulation.

Interactionist Accounts

It has been suggested that confabulation arises as a result of an interaction of factors. Some authors (see Kopelman et al., 1997) argue that confabulations are produced as a result of an interaction of three specific factors: a vivid imagination; an inability to retrieve autobiographical memories systematically (see McKay, Singer & Conway, this volume); and source monitoring deficits (Johnson, O'Conner & Cantor, 1997). Kopelman's et al. (1997) systematic investigation of severely confabulating patient errors produced similar conclusions. The study concluded that multiple factors were functioning to produce irregular and unchecked responses, namely: current environmental and social cues; perseverations, especially in semantic memory; and inappropriate recall of 'real' memory fragments out of temporal sequence.

Aligned with this framework Fotopoulou and colleagues in a series of studies assessed the role of emotion in memory-related confabulation (see Fotopoulou, 2010, for review). Fotopoulou's adaptation of traditional motivational accounts of confabulation can therefore similarly be identified as an interactionist approach in that a combination of factors, both neurocognitive and psychosocial, are proposed. The main hypothesis put forward by these investigations is that the false recollections of confabulating patients should show a *self-serving bias* that is greater than that encountered in the memory distortions of healthy volunteers (Walker, Skowronski & Thompson, 2000). Consistent

with the above hypothesis, the content of spontaneous confabulation has been found to contain mostly positive and wishful descriptions of the "self" in a number of single-case studies and experimental investigations (Fotopoulou, Solms & Turnbull, 2004; Fotopoulou, Conway, Griffiths, Birchall & Tyrer, 2007a; Fotopoulou, Conway & Solms, 2007b; Fotopoulou, Conway, Tyrer & Kopelman, 2008a; Turnbull, Berry & Evens, 2004). The motivated content of the confabulation was found to serve a dual function: self-enhancement (personification of ones self-image) and self-coherence (adherence to the premorbid image). This was highlighted by Fotopoulou's et al. (2008a) prose recall study, in which patients with spontaneous confabulation showed a selective bias in distorting the recall of originally negative self-referent stories; their confabulations served to portray a positive self-image in the recalled stories. Interestingly this positive bias in memory recall is also found in healthy individuals (Walker & Skowronski, 2003), showing that people memory of the past is often positively bias with unpleasant memories "fading" faster than those associated with pleasant events.

It was further found that confabulating patients are more likely to include false or temporally irrelevant experiences and self-representations in their confabulations if they are self-enhancing than if they are not (Fotopoulou et al., 2007a). The case example below illustrates how confabulations are constructed based on an increase in motivational self-enhancement needs and impairment in the executive control of memory.

Case example

> LH is a 60-year-old right-handed man with no significant previous medical or psychiatric history. Following a small saccular aneurysm and subarachnoid haemorrhage, he underwent a craniotomy and clipping of the anterior communicating artery (ACoA) the following day. Neuroimaging

investigations confirmed a large infarction within the left frontal lobe, including the dorsolateral and ventromedial prefrontal cortex. On clinical examination 4 months post-surgery LH presented with amnesia, confabulation and dysexecutive syndrome, he was talkative, hyperactive and verbally disinhibited. LH's confabulations were often characteristic of positive self-representations and disorganized recall, often describing himself as "superior to others". He often commented that he was "frustrated" by other peoples "lower intellectual capacity", how they "were not particularly bright" and not as bright as him. He described how he was "honest with people… when they come up with the most ridiculous things" and how they are "grateful" for his guidance. (Fotopoulou, Conway, Griffiths, Birchall & Tyrer, 2007a)

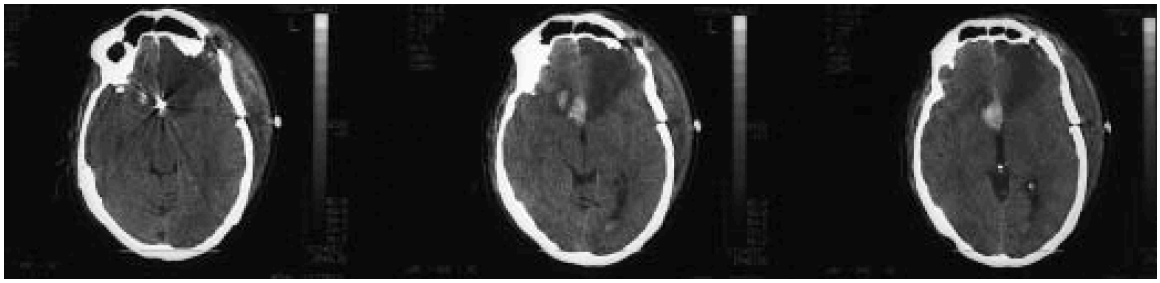

Figure 1. CT scan images 10 days post-surgery showing evidence of left frontal craniotomy. The scan shows a large acute infarction within left frontal lobe, and a smaller haematoma within the posterior aspect of the right frontal lobe. (From Fotopoulou et al. 2007)

Fotopoulou and colleagues have proposed that both confabulation and its motivated content result from a deficit in the control and regulation of memory retrieval. This allows motivational factors to acquire a greater role than usual in determining which memories are selected for retrieval and accepted as true. In this respect, it is argued that the self-enhancing and self-coherent content of confabulation could be explained as a 'neurogenic exaggeration of normal self-serving memory distortions' (Fotopoulou, 2010, p. 46). In summary, confabulating patients tend to show an exaggerated self-serving bias in their false memories, with the motivated content of confabulations serving two

functions: self-enhancement and self-coherence. These motivated memory distortions are mostly influenced by the patient's self-related wishes, concerns and preoccupations.

Momentary confabulations

Momentary or "provoked" confabulation is a common occurrence among amnesic patients. In distinguishing between spontaneous and "provoked" confabulation, Berlyne (1972) and Kopelman (1987b) describe momentary confabulation as fleeting intrusion errors. It is explained that these momentary confabulations are produced as a result to a response to provoked questions probing the patients' memory. For example, in memory tests, such as story recall, the patient is probed to answer memory-based questions. Here, they may often confuse incidents and events, or numbers and names, in their memory recall. However remaining very satisfied with their answers, they are unaware of any elaborations or false recollections. Several experimental investigations have concluded that these "provoked" confabulations closely resemble those made by healthy subjects (Bartlett, 1932; Hammersley & Reed, 1986; Kopelman, 1987; Lindsay & Read, 1994; Read & Lindsay, 1997; Schacter at al., 1998).

In comparing memory recall of amnesic patients to that of healthy controls, Kopelman's (1987b) study proposed that momentary confabulations may reflect a normal response to faulty or "fragile" memory and does not fully imply underlying neurological dysfunction. It has however recently been suggested patients with ventromedial or orbitofrontal pathology can present with both spontaneous and momentary confabulation (Turner, Cipolotti, Yousry & Shallice, 2008).

Other Forms of False Memories

Kopelman (1999, 2010) gives an account of specific circumstances in which false memories arise in the absence of overt neurological damage. Two examples have been selected for discussion: false confessions and pseudologia fantastica.

False confessions have been labeled as "confabulations" in specific circumstances where confessions are made on a voluntary basis (Gudjonsson, 2003; also see Gudjonsson & MacKeith, 1988). Gudjonsson, Kopelman and Mackeith (1999) describe a case example of false confession:

> A 17-year-old-man was eventually released from prison 25 years later…. He had low self-esteem and high suggestibility. During the course of his police interview lasting 48 hours (in the absence of a lawyer or doctor) he presented in a distressed and aroused state, who steadily progressed from thinking "It might have been me" to "I don't know if I killed her or not. I keep seeing her", through "I must have done it because I can see a picture of her" to "I am sure I killed her… I know I did it".

It has been suggested that in such cases false confessions may be attributed to source amnesia, and subsequently "memory distrust" (Johnson, Hashtroudi, Lindsay, 1993). Interviewees may therefore be confused as to the "source" of the memory- whether it is internally generated or external information- internalizing the resulting false confession. Gudjonsson describes these internalized false confessions as "confabulations".

Another example, 'pseudologia fantastica', is a rare psychiatric syndrome in which the patient adopts a false identity based on internalized "memories" (Kopelman, 1999). In most cases these patients do not have any known neurological damage, but it is more prevalent among people with low IQ or self-esteem. This phenomenon can be

considered as a form of confabulation, in so much as patients construct a new role or identity by compulsively creating a web of fantasies and self-deceptions around themselves (Fish, 1967). Kopelman (1999) reports a striking example:

> A young man, poorly educated and with reduced cognitive abilities talked endlessly about being a pop star, about the other pop starts he knew, and about his show business activities. However soon it became apparent that he lead a rather mundane life in South London and has been recently charged with a minor offence. Nevertheless, he appeared to believe his own stories, and had given himself a pop stars name and claimed to be "worldwide famous in Streatham".

In these rare psychiatric cases what is of particular interest is – given that the patient does not appear to be malingering - *why* the patient is so convinced by such false memories. Conway and Tacchi (1996; see Conway, 2005 for review) argue that the "self", understood as "a currently active set of personal plans and goals derived from a more elaborate representation", influences retrieval from autobiographical memory, while also being constrained by the autobiographical knowledge base. Autobiographical memories, as defined by Conway (1996; Conway & Tacchi, 1996), are transitory mental constructions that are effortfully constructed and effortfully maintained. Kopelman (1999) describes three layers of autobiographical memory, as identified by Conway (1996): lifetime periods, general events and event-specific knowledge. These function as a database of information that constructs a conception of "the working self". Lifetime periods, contained within the conception of "the working self", represent goals, plans, and themes of the self during these periods. In pseudologia fantastica, there is a bias and incoherent recall of these lifetime periods.

Summary and Proposed Model

Confabulations are produced as a result of a combination of factors. The main factors involved in confabulation may be: brain damage affecting frontal control and executive systems (spontaneous confabulation); a weak memory trace (momentary confabulation); social coercion and source memory errors, usually in the context of low self-esteem (false confession); and inconsistent or biased retrieval from autobiographical memory (pseudologia fantastica).

Kopelman (2010) proposed a general model of confabulation that considers cognitive dysfunctions in memory as well as executive functioning, while incorporating social and emotional factors. For a phenomenologically rich description of confabulation all these dimensions need to be taken into account.

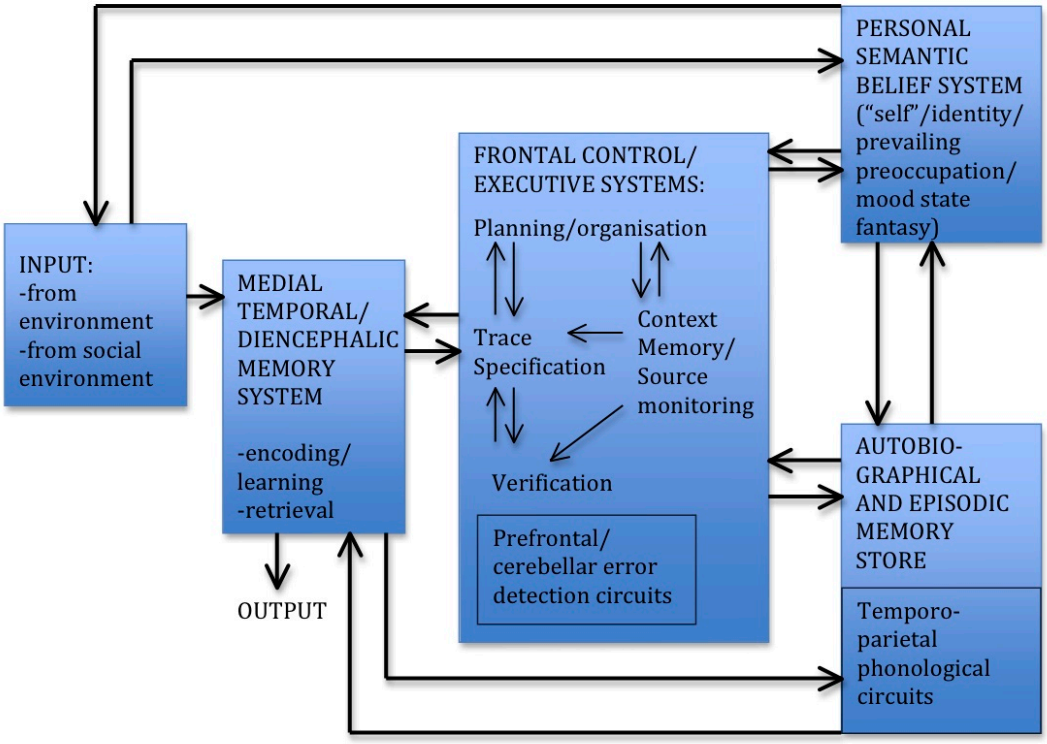

Figure 2. Social, personal, and biological (brain) systems involved in producing confabulation, false recognition and false memories.

Kopelmen's model suggests that a network of factors combine to produce confabulations. Here, the patients' unique clinical history, subjective account and experience of the disorder are particularly significant in understanding the motivational factors influencing confabulations. To produce proper clinical descriptions cognitive models need to accommodate the full range of context in which false memories arise.

Some forms of false memories are a direct consequence of neurological damage. For example, spontaneous confabulation can result due to damage to the "filter" systems within the ventromedial and orbitomedial frontal regions. The model further accommodates for other forms of false memories, for example, internalized confabulations in false confession. This results from a combination of psychosocial, personal and emotional factors that compromise frontal control processes. The model also draws to attention not only social factors but some notions of the "self", labeled as a "personal semantic belief system". Here, the motivational biases within the patients' confabulation are specifically highlighted, incorporating the meaningfulness of the confabulation from the subjective perspective of the patient.

Towards Neuropsychological Rehabilitation

Fotopoulou (2008b) maintains that although confabulating patients suffer from a host of cognitive related deficits described above, namely amnesia, executive dysfunction, source monitoring impairments and strategic retrieval deficits, almost no consideration has been given to effective management and rehabilitation strategies focused on improving these cognitive abilities. As a result there is a strong relationship between ongoing

confabulation and poor rehabilitation results (Mills et al., 2006). Only a few studies have accounted for rehabilitation challenges and possible intervention strategies to address the needs of confabulating patients (Dayus & van den Broek, 2000; Del Grosso Destreri et al., 2002; DeLuca, 1992; DeLuca & Locker, 1996).

Fotopoulou (2008b) was the first to propose a unique rehabilitation approach tailored to the specific needs of confabulating patients. It is emphasized that neurocognitve deficits are not sufficient to account for the content of the confabulation, and that the patients own experience must be considered. The next section will present this rehabilitation approach, relating three specific factors- self-narratives, damaged selves, and "false" selves- in neuropsychological rehabilitation as essential to understanding the patients' subjective experience of confabulation.

Self-narratives

The patient's subjective experience of *themselves* following brain damage is an important factor that may influence the effectiveness of rehabilitations interventions. Severe anxiety and depression is typically reported in confabulating patient's, due to their experience of a loss of premorbid self-identity (Cantor et al., 2005), or a significant difference between their premorbid and postmorbid self-images (Dewar & Gracey, 2007; Wright & Telford, 1996). For example, stroke survivors often hold unrealistic hopes of recovery, believing they will return to their construction of a positive and possibly idealized self (Tyerman & Humphrey, 1984).

Damaged selves

To construct a coherent and continuous self-narrative requires the ability to appropriately encode, store and retrieve episodic and autobiographical memories (Conway & Fthanaki, 2000; Gallagher, 2000; Schacter, 1996). Autobiographical memory here is refereeing to the "relative reconstruction of the past in light of the present" (Fotopoulou, 2008, p 548). Therefore, lost or disrupted memories may lead to the experience of a fragmented identity. This may be of greater concern to the patient, more so than other over postmorbid difficulties. As a consequence the patients may retreat into their preserved memories and seemingly begin to live in the past (Conway & Tacchi, 1996).

False selves

Difficulties in retrieving memories in an organized and reality-consistent manner often prevent confabulating patients to remember their past (Gilboa et al., 2006; Moscovitch, 1989). Patients are able to encode or store information, and hence *do* remember something, even if it is highly distorted or fabricated. In this respect, confabulating patients do not simply have disconnected self-narratives. They instead construct false "selves". The patient may even go as far as to insist that they are someone else, doing something else and having a different profession and family. As Fotopoulou (2008) explains when referring to memory disturbances in confabulating patients, "the loss of ability to remember experiences in an organised way may lead to exaggerated reconstruction and poor correspondence of the self to reality" (p 561). Specifically, the construction of false selves is related to a failure in retrieval in that confabulating patients, do not fail to encode, or to store information, but have difficulty retrieving events and information from their on autobiography in a

systematic and reality-consistent way. Instead, they construct new and disorganized personal memories and corresponding self-narratives according to motivational principles.

A case example reported by Fotopoulou (2008b) will be used to illustrate how seemingly meaningless false memories are actually meaningful if placed in the context of the patient's own perspective and autobiographical memory. The case material highlights the implications of this approach in enhancing effective management and rehabilitation strategies in confabulating patients'. A phenomenologically oriented approach guided the described rehabilitation intervention, taking into account: the neurocognitive deficits, the motivated content of the confabulation and subsequent functions of self-coherence and self-advancement it serves. This chapter does not attempt to describe the full details of the patients' rehabilitation. Rather emphasis is placed on the content of the patients' confabulation, the initial challenges of his rehabilitation and the practical steps taken to address them.

Case report: patient RM

RM was a 19-year-old window fitter with 11 years of education, hospitalised following a severe road traffic accident. His GCS (Glasgow Coma Scale) score on admission was 4/15. He was found to have a subarachnoid haemorrhage, left frontal and bilateral temporal contusions and compressed ventricles. He required a bifrontal decompressure craniotomy and insertion of an external ventricular drain (EVD) five days post-admission following increased intracranial pressure. Subsequent computed tomography (CT) scans revealed bi-frontal damage with small contusions in the left frontal lobe and a larger single contusion in the right medial aspect of the frontal lobe. There was extensive low density in the left anterior frontal region.

He was transferred to a multidisciplinary neurorehabilitation in-patient ward six months following his injury. He had made a good physical recovery but his disorientation in time, his profound amnesia, and his spontaneous confabulation were immediately evident. He also had problems in initiating behaviour, planning ahead his activities and monitoring himself (see Fotopoulou et al., 2007b for formal neuropsychological testing results). Relatives described substantial changes in RM's personality in that he kept talking about himself and he was often irritable and tearful. RM also appeared anosognosic (unaware of his deficits), in that he believed he had recovered fully from his accident, and that he could work, drive and live independently without any assistance.

RM participated in various individual and group sessions of a multidisciplinary rehabilitation programme, which aimed to address RM's cognitive difficulties and a number of functional and vocational goals. His engagement in rehabilitation activities was initially very poor as he was not motivated and required constant prompting and supervision. Attempts to contradict his anosognosia and increase his motivation were often ineffective as RM immediately provided a series of confabulations to support his alleged abilities and he was particularly sensitive to poor

> performance and negative feedback. Using written materials for reality orientation and confrontation had some effect, but it was extremely time-consuming as RM was quick to make up long and complicated stories. It was particularly difficult to prevent him from completing the story he had decided to convey.
>
> RM was recruited to a study on confabulation using the phenomenological framework outlined above. Previous findings on the motivated content of confabulation were communicated to the clinicians responsible for his care. This perspective was integrated in his rehabilitation programme; particularly in his individual sessions with the clinical neuropsychologist and the occupational therapist, and in staff members' decision to contradict his confabulations only in well-structured sessions and only in non-self-threatening ways. Nine months following the completion of his in-patient rehabilitation programme RM had achieve his main goal of living alone with merely visiting carers and with a potential for paid employment in the near future. His executive functions and memory had improved and he confabulated only minimally. (Fotopoulou, 2008b)

The influence of the premorbid, idealized and wishful self

Fotopoulou (2008b) reports that RM's relatives confirmed that several of his confabulations were false versions of real past experiences. Fotopoulou explains that these had typically been important to the patient and may have served as sources of personal identity. For example, RM often confabulated about important school events and prized he had won (influence of premorbid self). The case-study demonstrates that although confabulations can refer to true past events, they are often highly exaggerated in order to enhance the patients' abilities and achievements. For example, RM was once a good football player at school, and had been once named "player of the year", but RM often referred to this event happening 4 to 5 years in a row (idealized self). The author

also describes that RM's confabulations were frequently directly related to his current needs. For example, the ward doorbell would ring prompting a confabulation from RM about his relatives coming to see him. Although the patient knew about the scheduled visiting times, he continued to confabulate such visits. These confabulations were only reduced with cognitive training and non-confrontational discussions about his desires (wishful self).

Implications for rehabilitation

Fotopoulou's (2008b) rehabilitation approach emphasizes that the rehabilitation staff and relatives need to understand these confabulations beyond their apparent contradiction with reality. The approach encourages clinicians to explore with patients and their relatives the subjective meaning of these confabulations and how they serve to preserve a sense of self-identity and self-esteem. For example, when RM's confabulations did not directly disrupt his everyday responsibilities and social interactions, rehabilitation staff avoided confirming or contradicting his false beliefs. Fotopoulou suggests a few practical guidelines for rehabilitation staff that were previously successful in the case of RM: (1) to respond to the patients statements at face value with natural interest and curiosity, (2) to discreetly suggest and add correct background information to their stories, when possible, (3) to pace the conversation with the patient and to try stay within the conversational topic, (4) to explore memories and current facts, by taking into account both the patient's emotions and emotions of others and their need for a shared reality.

Third-person perspective and social context

Fotopoulou (2008b) proposes that conversations using a "third-person" perspective with the patient may be an alternative method used for enhancing both therapeutic rapport and patients' awareness of brain-related injury. In the case-study presented, RM appeared to be less likely to confabulate and more open to discuss his injury when he related the experience in the "third person" (see McGkynn & Kaszniak, 1991; Reisberg, Gordon, McGarthy & Ferris, 1985). In engaging with the patient Fotopoulou described "a man who had suffered from brain injury after a car accident". She reports that the patient immediately reciprocated with highly insightful comments. The patient commented on how upset and scared the man must feel about his condition and how it seems he may never "go back to his own self". Fotopoulou reports that further prompting using a third-person perspective led RM to conclude that the proposed man with brain damage "is a bit like me and the rest of the lads here" and that "the man will need help, the problem is he does not know how to ask for it".

Other studies have similarly concluded that patients with unawareness or denial of stroke-induced paralysis (anosognosia for hemiplegia) are more likely to acknowledge their deficit when asked in the third- as opposed to first- person questions (Marcel, Tegner and Nimmo-Smith, 2004). More recent case investigations similarly suggest that such patients' may initially come to understand their illness through third person encounters. For example, patient ED could only understand and later internalize that she had a stroke by use of a third-person observation: "The doctors tell me I have had a stroke, they must be right. I am not so sure, but the doctors are the experts, so I must have had a stroke" (Fotopoulou & Besharati, unpublished). Indeed, our own studies have

shown that patients who produce confabulations about the self, as well as patients who show delusions about their own body (such as patients with anosognosia for hemiplegia and somatoparaphrenia) show better awareness from a third than a first person perspective. We have shown that third-person perspective discussions with confabulating patients can enhance their awareness into their deficits (Fotopoulou, 2008). In more recent studies, we have also shown that mirror and video self-observation which entail viewing oneself from the outside, i.e. from a third-person perspective, can lead to dramatic changes in self-awareness (Fotopoulou et al., 2009; 2011; Jenkinson et al., 2013). We have also reported similar results in the verbal domain (Fotopoulou et al., 2011). Although speculative at this stage, we believe such dramatic changes in self-awareness relate to social cognition and the constitution of the self in socially 'shared' respective (Fotopoulou, 2008; 2010). We base our hypotheses on the fact that both of these syndromes show deficits in parts of the mentalisation network, including the ventromedial prefrontal cortex in the case of confabulating patients and the temporoparietal junctions and the superior temporal sulcus in the case of anosognosic patients (see Fotopoulou et al., 2010; Vocat et al., 2010). Future studies will of course need to test these patients' mentalisation, perspective-taking and social cognition abilities before this hypothesis is confirmed.

As discussions in the "third-person" may be a powerful tool used in rehabilitation interventions, Fotopoulou (2008b, 2010) also suggests that the social context of the confabulation and the patients' social environment are equally as important. Similarly highlighted in Kopelman's (2010) model of the systems involved in confabulation, the

patients' social environment and psychosocial factors must all be considered. Fotopoulou continues to explain that there is typically a lack of shared reality between the patient and their family. It is suggested that relatives and friends should be encouraged to help the patient understand how they have changed, identify their loss and adapt to new social roles.

We propose that the critical link between the mechanisms that produce false memories and beliefs about the self relate to processes that are responsible for the social constitution of the self. As mentioned above, these may include perspective taking-abilities so that the self, as well as others, can be appreciated from different, shared perspectives, as well as more higher-order processes of mentalisation (thinking about the self and other's as intentional agents) and related emotion regulation mechanisms. Although these patients have the ability to represent themselves from third-person perspectives when the latter are 'introduced' by the examiner by verbal or visual means, their habitual perspective on the world seems dominated by egocentric and wishful biases. Such biases affect the formation of both memories and beliefs (Fotopoulou, 2010).

Summary

In brief, rehabilitation interventions with confabulating patients should take into account both the neurological deficits and the motivated content of the confabulation. The dual functions of self-coherence and self-enhancement must be considered when accessing the underlying motivational factors (See also see McKay, Singer & Conway; Corlett & Fiorillo; Sterzer & Mishara, this volume). Fotopoulou's (2008b) rehabilitation approach

encourages clinicians to explore the subjective meaning of the confabulations and provide non-threatening feedback. Within this approach confabulations are understood as being both cognitively and motivationally constructed, and additionally influenced by the social context. It is additionally suggested that using a "third-person" perspective can be useful in confronting potentially negative and disability related discussions.

Conclusion

This chapter has reviewed a variety of situations in which confabulations can arise. It has distinguished between spontaneous confabulation, momentary confabulation and other forms of false memories. This chapter has also demonstrated how false memories can arise in many situations that are not necessarily related to overt neurological damage. Confabulations may result from a combination or interaction of social and biological factors. Kopelman's (2010) general model of confabulation emphasizes that a network of factors combine to produce confabulations. For a phenomenologically rich description of confabulation all these dimensions need to be taken into account.

The phenomenologically oriented approach to neurocognitive rehabilitation with confabulating patients should consider both neurological deficits and psychosocial factors. In this context Fotopoulou's (2008b) unique rehabilitation approach integrates: (1) the motivated content of confabulations, (2) the subjective experience of the patient, and (3) the social context. Using Fotopoulou's case-study example this chapter has emphasized how all these factors must be considered for effective management and rehabilitation interventions.

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